LOUISIANA, AN ENERGY CONSUMING STATE: AN UPDATE USING 2002 DATA

by
Bryan Crouch, P.E.

In 2002, Louisiana consumed 3,689.1 trillion BTUs (TBTUs) of energy, ranking it 8th among the states in total energy consumption. Figures 1 & 2 show the total energy consumption as percentages attributable to sector and source, respectively.

Figure 1. Louisiana Energy Consumption Percentage by Sector - 2002

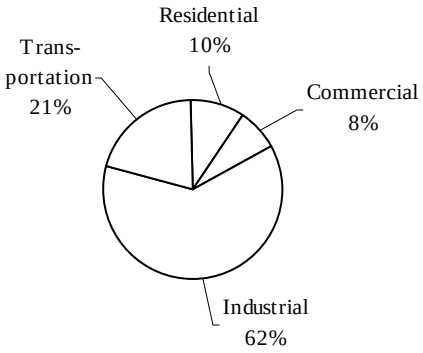
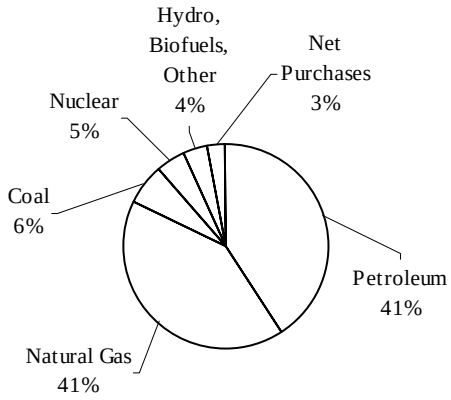


Figure 2. Louisiana Energy Consumption Percentage by Source - 2002



The industrial sector is, by far, the largest energy consumer in Louisiana. The abundance of Louisiana's natural resources has, historically, meant low energy prices, which have attracted a large cluster of energy intensive industries to the State. The large industrial sector consumption is also reflected in Louisiana's high natural gas consumption, which is used both as an energy source and a feedstock.

Table 1 shows where Louisiana ranks among the states in various energy consumption categories, and lists the top energy consuming state for each category. Louisiana's high ranking for per capita energy consumption is a reflection of high industrial energy consumption.

Louisiana also produced large quantities of energy. Table 2, on the following page, compares Louisiana's energy consumption to its energy production. It shows that, in 2002, Louisiana consumed 1,315 TBTUs moer energy than it produced if Louisiana OCS oil and gas production is not included.

Table 1. Louisiana Energy Consumption Rankings Among the States - 2002

Category	Rank	TBTU	#1 State (TBTU)
Residential	22	372.5	Texas (1,632.8)
Commercial	23	272.6	California (1,472.8)
Industrial	2 *	2,265.7	Texas (6,721.1)
Transportation	11	778.2	California (3,134.1)
Coal	31	232.1	Texas (1,550.3)
Natural Gas	3	1,526.2	Texas (4,721.9)
Petroleum	5	1,506.5	Texas (5,666.7)
Electricity	16	270.4	Texas (1,094.7)
Total	8	3,689.1	Texas (12,489.3)
Per Capita (MBTU)	3	824.2	Alaska (1,149.1)

* For this item, we have updated data showing a 2004 ranking of 3rd

Table 2. Louisiana Energy Balance - 2002[1]

ENERGY SOURCE		PRODUCTION		CONSUMPTION		NET STATE ENERGY PRODUCTION	
						Excluding OCS	Including OCS
PETROLEUM:	STATE OIL[2]	543.4 TBTU[4] (93.7 MMBBL)		1,506.5 TBTU (293.7 MMBBL)		-963.1 TBTU	1,987.0 TBTU
	LOUISIANA OCS OIL[2]	2,950.1 TBTU[4] (508.6 MMBBL)					
NATURAL GAS:	STATE GAS[3]	1,457.4 TBTU[4] (1.362 TCF)		1,526.2 TBTU (1.426 TCF)		-68.8 TBTU	3,632.0 TBTU
	LOUISIANA OCS GAS[3]	3,700.8 TBTU[4] (3.458 TCF)					
COAL:	LIGNITE	51.1 TBTU (3.503 MMSTON)		232.1 TBTU (14.676 MMSTON)		-181.0 TBTU	-181.0 TBTU
NUCLEAR ELECTRIC POWER		180.7 TBTU (17.305 Billion KWHR		180.7 TBTU (17.305 Billion KWHR)		0.0 TBTU	0.0 TBTU
HYDROELECTRIC, BIOFUELS & OTHER		141.5 TBTU		141.5 TBTU		0.0 TBTU	0.0 TBTU
NET INTERSTATE PURCHASES OF ELECTRICITY INCLUDING ASSOCIATED LOSSES				102.1 TBTU (32.097 Billion KWHR)		-102.1 TBTU	-102.1 TBTU
TOTALS:	EXCLUDING LOUISIANA OCS	2,374.1 TBTU		3,689.1 TBTU		-1,315.0 TBTU	
	INCLUDING LOUISIANA OCS	9,025.0 TBTU		3,689.1 TBTU			5,335.9 TBTU

The Louisiana energy balance for 2002 shows that the state consumed 1,315 more TBTUs of energy than it produced if Louisiana OCS production is not included. If Louisiana OCS production is included, the state is a net producer of energy by 5,335 TBTUs.

TCF = Trillion Cubic Feet
TBTU = Trillion BTU's
MMBBL = Million Barrels
OCS = Outer Continental Shelf (federal waters seaward of the state's 3-mile offshore boundary)
KWHR = Kilowatt hour
MMSTON = Million Short Tons

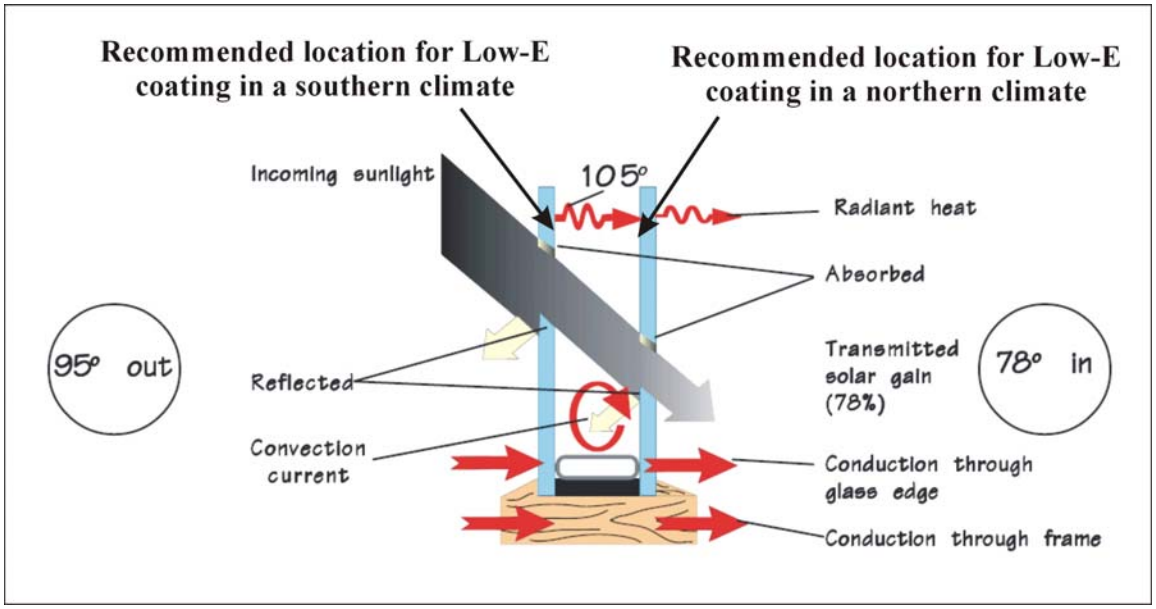
1. Unless otherwise noted, data is obtained from the Energy Information Administration's latest published figures for state energy consumption.
2. Includes condensate
3. Includes gas plant liquids
4. Louisiana Department of Natural Resources data

CONFUSED ABOUT WINDOWS?

by
Buddy Justice
Environmental Consultant

In Louisiana, many home owners are confused by window manufacturer's claims that their windows will save the homeowner a lot of money on their utility bills. The important thing to remember is that, in order for windows to provide energy efficiency, they need to perform differently in the northern U. S. than they do in the southern U. S. Heat always tries to move from the hotter side of the window to the colder side. In the southern U. S., the main concern is to keep the heat outside during the summer, and in the northern U. S., the main concern is to keep the heat inside during the winter.

Summer Heat Gain in a Typical Double-Glazed Window



Source: Builders Guide to Energy Efficient Homes in Louisiana, Department of Natural Resources, October 2002

Heat moves through windows in three ways: 1) conduction – heat moving through the window's solid materials (like heat traveling from a pot of boiling water through a metal spoon placed in it), 2) convection – heat moving through leaks and by the movement of hot air rising and replacing the colder air that was there, and 3) radiation – on a cold day when the sun is shining and you sit in the sunlight and feel the warmth of the sun, that warmth is due to radiation. You can guess that radiant heat is also present during the summer. Radiant heat travels through glass, away from the source, and not back toward the source. Once radiant heat gets inside the home, it stays there until it can be removed by the air conditioning system.

In order to control convective heat, tightly constructed windows that meet industry standards for acceptable infiltration rates should be used. Insuring that windows are properly fitted into and

caulked around the outside perimeter of the window opening and frame is also needed in window installations to control convective heat.

Well insulated windows are desirable to control conductive heat. The ability of a window to control conductive heat is rated by the windows U-factor**.** The lower (numerically) the U-factor rating of the window, the better it performs at controlling conductive heat. A good U-factor rating is what is referred to when window manufacturers boast of high-quality insulated windows. The U-factor rating of windows used in the northern U. S. is more critical than for the southern U. S. During northern U. S. winters, outside temperatures can fall to -10° or -20° Fahrenheit (F). A typical temperature inside the home would be around 70°F, resulting in a difference in temperature of up to 90°F. During southern U. S. summers, outside temperatures can reach 100°F to 110°F. A typical temperature inside the home would also be around 70°F resulting in a difference in temperature of only 40°F. This difference in temperature, or conductive heat flow, is what U-factor controls. In the northern U. S., conductive heat flow through windows (90°F temperature difference) is more than twice as high as in the South (40°F temperature difference).

Radiant heat is the heat that is radiated away from the heat source through open space. It passes straight through glass, unless it is acted upon by the glass in some way. In the southern U. S., this type of heat gain is the greatest heat gain attributed to windows. The ability of a window to control radiant heat is rated by the windows Solar Heat Gain Coefficient (SHGC). SHGC gives no indication of how well the window controls conductive heat. The lower (numerically) the SHGC rating of the window, the better it performs at controlling radiant heat. A window with a good SHGC will reflect the radiant heat back toward the source of the radiant heat. During northern U. S. winters, the desire is that the radiant heat be reflected back toward the heat source inside of the home (the furnace). During southern U. S. summers, the desire is that the radiant heat be reflected back toward the heat source outside the home (the sun). A good SHGC rating on a window is accomplished be applying a Low-E coating to one surface of the glass. Whatever glass surface that this Low-E coating is applied to determines in which climate the window performs the best. In a Southern climate, to insure that the Low-E coating is installed on the proper glass surface, specify Soft Coat Low-E. This tells the window manufacturer that the Low-E coating is applied to the inside surface of the outermost glass, and will reflect radiant heat back toward the outside of the home.

Windows that are gas filled have an inert gas, usually argon, installed between the glass panes to further control conductive, and convective heat flow. Gas filled windows are usually much more expensive than non-gas filled windows. It is a matter of personal choice weather a home owner chooses to purchase gas filled windows, but, again, conductive heat flow is much more critical in the northern U. S. than it is in the southern U. S., so why pay more for windows that are better suited for a northern climate. The recommended windows for installation in Louisiana are windows with a U-factor of .65 or below that also have a SHGC of .40 or below. Specify Soft coat Low-E to insure that the Low-E coating is on the correct surface of glass for a southern U. S. climate. Windows with these specifications will perform best in Louisiana's climate.

HOW HOMEBUILDERS AND HOMEOWNERS CAN SAVE MONEY WITH EPACT 2005

by
Howard Hershberg, A.I.A., Architect Supervisor and ERHL Manager

The Energy Policy Act of 2005 (EPACT 2005) is the first attempt to address national energy policy since the Energy Policy Act of 1992. It offers both residential homebuilders and homeowners tax incentives for a number of energy efficiency measures.

A tax deduction reduces the total income on which the total tax is computed. A tax credit is deducted directly from the total tax liability. A tax credit may be more advantageous to a taxpayer than a deduction. For example, a tax credit of $1,000 for someone in the 28% tax bracket is equivalent to a tax deduction of $3,571.

EPACT 2005 also provides tax credits of 10% of the amount expended by the taxpayer for qualified energy efficiency improvements to existing homes**,** and up to $300 for qualified energy property. The maximum tax credit for either category, or a combination of the two, is $500. These incentives apply to improvements placed in service during 2006-2007.

EPACT 2005 provides tax credits on “energy improvements” or “energy property” as follows:

Qualified energy improvements are insulation material, exterior windows and doors, and metal roofs with pigmented coatings designed to reduce heat gain. All of the above must meet ENERGYSTAR requirements.

Qualified energy property is defined as:

- Electric heat pump water heaters with an Efficiency Factor (EF) of 2.0 or greater
- Electric air source heat pumps with a Heating Season Performance Factor (HSPF) of 9.0 or better
- Geothermal heat pumps:
  a. Closed loop products with an Energy Efficiency Ratio (EER) of 16.2, and a Coefficient of Performance (COP) of 3.3 or greater.
  b. Open loop products with an EER of 14.1 and a COP of 3.3 or greater.
  c. Direct Expansion (DX) products with an EER of 15 and a COP of 3.5 or greater.
- Heating Ventilating and Air Conditioning (HVAC) system that receives the highest efficiency tier established by the Consortium of Energy Efficiency as of January 1, 2006
- Natural gas, propane, or oil water heater with an EF of .80 or greater
- Natural gas, propane, or oil furnace or hot water boiler with Annual Fuel Utilization Efficiency (AFUE) of 95% or greater
- Advanced main air circulating fan used in natural gas, propane, or oil furnace that uses no more than 2%of the total energy use of the furnace

Tax credit limitations on qualified energy property are as follows:

- $50 on any advanced main air circulating fan

- $150 on any qualified natural gas, propane, or oil furnace or hot water boiler
- $300 for a high efficiency air conditioner

Summarized in Tables 1 & 2 below are the potential tax credit items for residential homebuilders and homeowners. The incentives apply to equipment placed in service during 2006-2007.

Table 1. Tax Credit Items for a Homebuilder or Homeowner for New or Existing Homes

• Tax credits for solar hot water systems - the potential tax credit is 30% of the qualified solar system expenditures up to a maximum of $2000. • To be eligible for the solar hot water system tax credit, the overall system must be certified by the Solar Rating and Certification Corporation (SRCC) and must produce 50% (or more) of the hot water required by the residence.
• Tax credits for Residential Solar Photovoltaic (PV) systems - the potential allowable tax credit is 30% of the qualified PV system expenditures up to a maximum of $2000. • There is no certification required for PV systems.
• Homeowners may claim tax credits for either or both types of solar systems.
• Tax credit for residential fuel cells: Providing a residential fuel cell offers the owner a 30% tax credit (up to a maximum credit limitation of $500 for each 500 watts of installed capacity).

Table 2. Tax Credit Items for a Homebuilder or Homeowner for New Homes

EPACT 2005 offers homebuilders a tax credit of $2,000 for homes that reduce energy for heating and cooling by 50% compared to the 2006 International Energy Conservation Code (IECC) Supplement.
• Eligible homes have to demonstrate energy savings through the use of software approved by the U.S. Department of Energy (DOE), and builders must demonstrate compliance through the use of third party inspectors such as Residential Energy Services Network (RESNET) Certified Energy Raters.
Manufactured home producers may qualify for a tax credit of $1,000 for new manufactured homes that reduce energy consumption by 30%.
• To qualify, the new manufactured home must be in compliance with the Housing and Urban Development Code (HUD), Section 3280, Title 24, must be 30% more efficient than IECC 2006 for qualified energy improvements, or meet the ENERGYSTAR labeled homes program.
These tax incentives apply to site built homes and manufactured homes placed in service and sold prior to January 1, 2008. However, there is the possibility that they may be extended through 2009.

Further information on EPACT 2005 (including commercial applications, etc.) can be found at the following links: http://dnr.louisiana.gov/tad, http://www.aceee.org, or http://www.fsec.ucf.edu.